

Appin. No. 10/065,854  
Docket No. 122432 CIP/GEM-0018-P

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### REMARKS / ARGUMENTS

Applicant thanks the Examiner for the courtesy extended during a telephone conference on April 4, 2007, where further clarification on the 112-2 rejections were provided. This amendment paper is in response to that telephone conference, and is believed to address all of the points raised by the Examiner.

In the event that the Examiner still maintains a position other than allowance in this case, Applicant's Attorneys request a telephone conference with the Examiner to address outstanding issues prior to the mailing of an Office Action in response to this Amendment.

#### Status of Claims

Claims 1-4, 6-19, 21, 22, 28-34, 37-48, 50, 51, 53, 55 and 58-61 are pending in the application. Claims 1-4, 6-19, 21, 22, 28-34, 37-48, 50, 51, 53, 55 and 58-61 stand rejected and objected to. Applicant has canceled Claims 28-33, 53 and 55, leaving Claims 1-4, 6-19, 21, 22, 34, 37-48, 50, 51, and 58-61 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §112, second paragraph, and 35 U.S.C. §103(a), have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

#### Rejections Under 35 U.S.C. §112, Second Paragraph

Claims 1-4, 6-19, 21, 22 and 58-61 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

Applicant traverses this rejection for the following reasons.

Applicant submits that where the claims define patentable subject matter with a reasonable degree of particularity and distinctness, the claims should be allowed. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as may be desired. Claims should not be

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rejected if the expression selected by Applicant satisfies the statutory requirements. In viewing a claim for compliance with 35 U.S.C. §112, second paragraph, the claim as a whole must be considered to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the required notice function. MPEP 2173.02. (Emphasis in the original).

From Final Action Paper No. 20061030, pages 2-3, the Claim 1 limitations at issue are directed to:

“...employing a feature selection algorithm on *the region of interest* to sort through candidate features of the region of interest, classifying a candidate region of interest on each image, and subsequently combining results of all of the computer aided processing operations...”.

The Examiner alleges that Claim 1 is indefinite for reasons stated on pages 2-3 of Final Action Paper No. 20061030.

Applicant respectfully disagrees that Claim 1 is indefinite for reasons stated on pages 10-13 of After Final Amendment Paper dated January 3, 2007.

In alleging indefiniteness, the Examiner “implies” from a reading of the claim that “the region of interest has already been selected and that we are now looking for features within that region of interest. In other words, we would say that *the region of interest* has already been *classified*.” The Examiner then states, “the examiner will interpret the claim such that *the region of interest* has already been *classified* as a region of interest by the time we begin to sort through candidate features on that region of interest.” Paper No. 20061030, page 3.

In respectful disagreement with the Examiner, Applicant submits that the Examiner’s paraphrasing of the claim language has changed and mischaracterized the scope of the claimed invention.

Claim 1 recites “a region of interest” and “a candidate region of interest”, which Applicant submits are specifically directed to two different limitations consistent with the description of the invention set forth in the specification. However, it appears to Applicant that the Examiner is treating the two distinct limitations as one.

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In a prior Amendment paper dated September 15, 2006, Applicant specifically amended the Claim 1 language "the candidate region of interest" to read "a candidate region of interest" in order to distinguish the limitation of "a candidate region of interest" from the limitation of "a region of interest". While the claim language may not be as precise as the Examiner would like, Applicant submits that some latitude should be permitted in the manner of expression and the aptness of terms used.

While Applicant respectfully disagrees with the Examiner's interpretation of the claim language for reasons already stated, Applicant has nonetheless, in an effort to advance this case to allowance, amended Claim 1 to now recite, inter alia,

"...employing a feature selection algorithm on the region of interest to sort through *features of the region of interest to result in candidate features that define a candidate region of interest*, the candidate region of interest being *a subset of the region of interest*, classifying the candidate region of interest on each image, and subsequently combining results of all of the computer aided processing operations;..."

No new matter has been added as antecedent support can be found in the application as originally filed such as at paragraphs [0050], [0051], [0053-0055], [0057] and [0063-0067], and at Figures 6, 7 and 11, for example.

Here, Applicant is clearly defining a step of *sorting features of a region of interest to result in candidate features that define a candidate region of interest*, and *then classifying the candidate region of interest* on each image. That is, the sorting results in a candidate region of interest (a subset of the region of interest), which is then classified. The steps of sorting and classifying is consistent with the description in the application, such as at paragraph [0054-0055] and at figures 6-7 (once the features are selected/sorted 230, they are classified 240), for example. The classification of whether a candidate feature is benign or malignant (paragraph [0055]) is performed once the candidate features have been identified/selected. After selection and before classification, the candidate features are just "candidate" features, and not yet "classified" features.

In view of the foregoing, Applicant submits that the Examiner's interpretation that "*the region of interest* has already been *classified* as a region of interest by the time we

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begin to sort through candidate features on that region of interest" is entirely contrary to the claimed invention, which claims sorting and then classifying, not classifying and then sorting.

Dependent claims inherit all of the limitations of the parent claim.

In view of the foregoing, Applicant respectfully submits that the claimed subject matter is described in such a manner that reasonably conveys to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention, defined the claimed subject matter with a reasonable degree of particularity and distinctness, and therefore respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §112, second paragraph, which Applicant considers to be traversed.

#### Claim Objections

Claims 1-4, 6-19, 21, 22 and 58-61 are objected to for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery, and for failing to conform to the invention as set forth in the remainder of the specification.

The Examiner comments that the reasons for this objection are stated in the above noted claim rejection under 35 U.S.C. §112, second paragraph.

In view of Applicant's remarks set forth above regarding the associated claim rejection under 35 U.S.C. §112, second paragraph, and absent further reasons for objection, Applicant respectfully submits that the claim objections have been overcome at least for the reasons set forth above, and therefore respectfully requests the Examiner to reconsider and withdraw these objections.

#### Rejections Under 35 U.S.C. §103(a)

**Group-1:** Claims 1-4, 6-8, 13-19, 29-32, 34, 42, 45, 53, 55, 58 and 60 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Giger et al. (U.S. Patent No.

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6,205,348, hereinafter Giger) in view of Sones et al. (U.S. Patent No. 4,792,900, hereinafter Sones).

**Group-2:** Claims 9-12, 21, 22, 28, 33, 37-41, 43, 44, 46 and 59 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Giger in view of Sones as applied and further in view of Nishikawa et al. (U.S. Patent No. 6,058,322, hereinafter Nishikawa).

**Group-3:** Claims 47-51 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nishikawa in view of Giger and Sones.

Applicant traverses these rejections for the following reasons.

Applicant respectfully submits that the obviousness rejection based on the References is improper as the References fail to teach or suggest each and every element of the instant invention in such a manner as to perform as the claimed invention performs. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

Additionally, Applicant respectfully submits that "to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." *In re Werner Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000) (citing: *In re Dance*, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984). There must also be a reasonable expectation of success in modifying or combining the prior art, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 USPQ2d 1016, 1023 (Fed. Cir. 1996). And, there must be some degree of predictability in showing the reasonable expectation of success. *In re Rinehart*, 189 USPQ 143 (CCPA 1976); MPEP §2143.03.

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### **Regarding Group-1**

Amended Claim 1 recites, inter alia:

“...employing a feature selection algorithm on the region of interest to sort through features of the region of interest to result in candidate features that define a candidate region of interest, the candidate region of interest being a subset of the region of interest, classifying the candidate region of interest on each image, and subsequently combining results of all of the computer aided processing operations;...”

In alleging obviousness, the Examiner applies Giger to show all but “the image set being arranged at the data source in such a manner as to allow the computer aided processing to be performed once, as opposed to parallel operations, by incorporating features from all images of the image set” (paper no. 20061030, page 4). In so doing, the Examiner has interpreted “the region of interest” and “the candidate region of interest” to be one and the same, which Applicant submits is entirely contrary to the claimed invention. As such, Applicant submits that Giger modified by Sones is deficient in teaching each and every element of the claimed invention arranged so as to perform as the claimed invention performs.

At col. 10, lines 30-31 of Giger, Applicant finds Giger to teach a ROI selection circuit 2002.

At col. 10, lines 42-46 of Giger, Applicant finds Giger to teach an ANN circuit 2050 that determines *the likelihood for risk of future fracture*, during which time the data are retained in image memory 2060.

In comparing Giger with the claimed invention, Applicant finds Giger to teach a *region of interest* (via circuit 2002), and a determination of *the likelihood for risk of future fracture* (via the 2050 ANN circuit) in that *same region of interest*, which Applicant submits is substantially different from “employing a feature selection algorithm on the region of interest to sort through features of the region of interest to result in candidate features that define a candidate region of interest, the candidate region of interest being a subset of the region of interest, classifying the candidate region of

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*interest on each image, and subsequently combining results of all of the computer aided processing operations".*

In view of the foregoing deficiencies in the prior art, Applicant submits that a prima facie case of obviousness cannot be established.

Claim 34 recites, inter alia:

"...selecting a region of interest within the bone image to search for a calcification, fracture or metastatic bone lesion;  
segmenting bone from a background of the bone image;  
identifying a candidate region within the bone as a candidate for a calcification, fracture, erosion, or metastatic bone lesion; and  
*classifying an identified candidate region* using a computer aided rule based approach, *wherein different rules apply for calcifications, metastases, erosions, and fractures, and for different types of fractures and different properties of metastases.*"

In alleging obviousness, the Examiner alleges a teaching of the above noted limitations by referencing Giger at Figure 28, col. 10, line 46, and at Figure 28, col. 10, lines 42-44. Paper No. 20061030, page 7.

However, it appears that the Examiner is equating the limitation of "a candidate region within the bone" with the limitation of "a region of interest within the bone image", which Applicant submits, as discussed above, are separate and distinct limitations of the claim.

At col. 10, lines 30-31 of Giger, Applicant finds Giger to teach a ROI selection circuit 2002.

At col. 10, lines 42-46 of Giger, Applicant finds Giger to teach an ANN circuit 2050 that determines *the likelihood for risk of future fracture*, during which time the data are retained in image memory 2060.

In comparing Giger with the claimed invention, Applicant finds Giger to teach *a region of interest* (via circuit 2002), and a determination of *the likelihood for risk of future fracture* (via the 2050 ANN circuit) in that *same region of interest*, and to be absent any teaching whatsoever of:

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“...selecting a region of interest within the bone image to search for a calcification, fracture or metastatic bone lesion;  
segmenting bone from a background of the bone image;  
identifying a candidate region within the bone as a candidate for a calcification, fracture, erosion, or metastatic bone lesion; and  
*classifying an identified candidate region* using a computer aided rule based approach, *wherein different rules apply for calcifications, metastases, erosions, and fractures, and for different types of fractures and different properties of metastases.*”

Not only does Applicant find Giger deficient in teaching *a candidate region within the bone* separate from *a region of interest within the bone image*, but also finds Giger to be deficient in teaching *wherein different rules apply for calcifications, metastases, erosions, and fractures, and for different types of fractures and different properties of metastases.*

Accordingly, even if Giger were to be modified as suggested by the Examiner, Applicant submits that the modified Giger would still be deficient in performing as the claimed invention performs, in addition to being deficient in teaching each and every element of the claimed invention when combined with the secondary references as alleged by the Examiner.

Regarding Claims 53 and 55, Applicant has canceled Claims 53 and 55, thereby obviating this rejection.

Dependent claims inherit all of the limitations of the respective parent claim and any intervening claim.

#### **Regarding Group-2**

Regarding Claims 28 and 33, Applicant has canceled Claims 28 and 33 and claims dependent therefrom, thereby obviating this rejection.

#### **Regarding Group-3**

Claim 47 recites limitations, albeit in alternative form, similar to those of Claims 1 and 34, discussed above. As such, Applicant submits that Claim 47 is allowable at least the reasons noted above with regard to Claims 1 and 34.



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In addition, however, Claim 47 recites, inter alia:

“...selecting a region of interest within the soft-tissue image to search for an indication of disease;  
segmenting the region of interest from a background of the soft-tissue image;  
identifying a candidate region within a bone image which correlates to the region of interest in the soft-tissue image;  
extracting features from the candidate region in the bone image; and,  
classifying the region of interest in the soft-tissue image as a candidate for soft-tissue disease utilizing the features extracted from the bone image, the classifying comprising using a computer aided rule based approach, wherein different rules apply for different medical conditions, and different rules are used for the soft-tissue and bone-images.”

In alleging obviousness of the claimed invention, the Examiner references Nishikawa at col. 10, lines 3-5 for support in teaching the limitation of “identifying a candidate region within *a bone image*”. However, Applicant finds Nishikawa at col. 10, lines 3-5 to teach imaging of microcalcifications embedded within breast tissue (a soft-tissue image, not a bone image) (see also Nishikawa col. 9, lines 64-65), which Applicant submits is substantially different than the claimed bone image and identifying a candidate region within the bone image.

At col. 9, lines 53-56, Applicant finds Nishikawa to teach a microcalcification to be assigned sizes on the order of 0.1-0.4 mm, which Applicant submits is substantially different from a bone image of a substantially thicker bone.

As such, Applicant submits that Nishikawa is deficient in teaching the alleged limitations of the claimed invention arranged so as to perform as the claimed invention performs, and submits that the secondary references fail to cure the deficiencies of Nishikawa.

Dependent claims inherit all of the limitations of the parent claim and any intervening claims.

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In view of the foregoing, Applicant submits that the References fail to teach or suggest each and every element of the claimed invention and are therefore wholly inadequate in their teaching of the claimed invention as a whole, fail to motivate one skilled in the art to do what the patent Applicant has done, fail to offer any reasonable expectation of success in combining the References to perform as the claimed invention performs, and discloses a substantially different invention from the claimed invention, and therefore cannot properly be used to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §103(a), which Applicant considers to be traversed.

In light of the foregoing remarks and amendments, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. 35 U.S.C. §112, second paragraph, and 35 U.S.C. §103(a), have been traversed, and that the application is now in condition for allowance. Such action is therefore respectfully requested.

If a communication with Applicant's Attorneys would assist in advancing this case to allowance, the Examiner is cordially invited to contact the undersigned prior to the mailing of an Office Action in response hereto so that any such issues may be promptly resolved.

The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

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In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above-identified Deposit Account.

Respectfully submitted,

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